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1914/15

REPORTS

OF THE

VISITING COMMITTEES OF THE BOARD OF OVERSEERS

OF

HARVARD COLLEGE

FOR THE ACADEMIC YEAR 1914–15

CAMBRIDGE, MASS.
Published by the University
1915

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In Board of Overseers
May 12, 1909

Voted, — That the Secretary of the Board be directed to print each year, under Section 31 of the Rules and By-Laws of the Board, a sufficient number of volumes, containing the Reports of the Visiting Committees, to supply the members of the Corporation and of the Board of Overseers.

Attest.

Winthrop H. Wade,
Secretary.

COMMITTEES APPOINTED BY THE BOARD OF OVERSEERS

1914-15

I

EXECUTIVE COMMITTEE

George Wigglesworth,
J. Pierpont Morgan,
Louis A. Frothingham,
Lawrence E. Sexton,
George v. L. Meyer,
Francis L. Higginson,
William Endicott.

COMMITTEE ON ELECTIONS

Theodore Roosevelt,
Henry Cabot Lodge,
George v. L. Meyer,
Frederick P. Fish,
Augustus E. Willson,
William Cameron Forbes.

II

HARVARD COLLEGE

Charles W. Eliot,
Theodore Roosevelt,
William C. Boyden,
William L. Richardson,
William R. Thayer,
George H. Palmer,
William Endicott.

GRADUATE SCHOOL OF ARTS AND SCIENCES

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Henry Cabot Lodge,
Evert J. Wendell,
Franklin B. Dyer,
Edward Robinson,
Arthur A. Noyes,
Francis B. Gummere,
William Preston Few,
William K. Richardson,
Paul Elmer More.

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Frederic A. Delano,
Frederick P. Fish,
James J. Myers,
Herbert C. Leeds,
John Lawrence,
Odin Roberts,
Franklin Remington,
Robert F. Herrick,
Ernest B. Dane,
Philip Stockton,
Edgar H. Wells,
George C. Kimball,
Frederick F. Ayer.

The School of Engineering

Edgar C. Felton,
Franklin Remington,
Ira N. Hollis,
Joseph R. Worcester,
Benjamin B. Thayer,
Francis Mason,
Clemens Herschel,
Robert Ridgway,
John F. Vaughan,
Odin Roberts.

The Mining School

John Hays Hammond,
Edgar C. Felton,
Charles P. Perin,
R. A. F. Penrose,
Quincy A. Shaw,
Benjamin B. Thayer,
Robert M. Catlin,
Pope Yeatman.

The School of Forestry

John S. Ames,
Frederick L. Olmsted,
James S. Russell,
Frederick J. Caulkins,
John E. Thayer,
George C. Cutler,
Henry James, Jr.,
Warner R. Butler.

The School of Architecture

Robert S. Peabody,
R. Clipston Sturgis,
J. Harleston Parker,
Charles K. Cummings,
Henry Forbes Bigelow,
Robert P. Bellows,
William S. Parker,
John Allyne Gade.

GRADUATE SCHOOL OF BUSINESS ADMINISTRATION

Howard Elliott,
J. Pierpont Morgan,
Thomas W. Lamont,
Charles W. Eliot,
William C. Boyden,
Thomas W. Slocum,
John W. Hallowell,
John S. Lawrence,
Charles H. Jones,
A. Shuman,
Walter C. Baylies,
James F. Curtis,
Adams D. Claflin,
Thomas K. Cummins,
Hermann F. Clarke.

DIVINITY SCHOOL

George A. Gordon,
James DeNormandie,
Charles E. Park,
Paul Revere Frothingham,
Augustus M. Lord,
Charles L. Noyes,
Charles T. Billings,
Francis G. Peabody.

LAW SCHOOL

Francis J. Swayze,
Langdon P. Marvin,
Robert Grant,
Chandler P. Anderson,
William C. Loring,
Louis D. Brandeis,
Joseph B. Warner,
Charles P. Greenough,
Henry L. Stimson.

MEDICAL SCHOOL

Frederick C. Shattuck,
J. Collins Warren,
Charles W. Eliot,
William L. Richardson,
George B. Shattuck,
Alexander Cochrane,
William Sturgis Bigelow,
Henry Saltonstall Howe,
Charles H. Tweed,
Harold Williams,
Wallace L. Pierce.

DENTAL SCHOOL

Charles P. Briggs,
William H. Aspinwall,
Charles H. Parker,
Cecil P. Wilson,
Samuel A. Hopkins.

UNIVERSITY EXTENSION

(INCLUDING THE SUMMER SCHOOL OF ARTS AND SCIENCES AND THE SCHOOL FOR SOCIAL WORKERS)

CHARLES W. ELIOT,
WILLIAM L. RICHARDSON,
HENRY CABOT LODGE,
ABBOT L. MILLS,
J. COLLINS WARREN,
GEORGE A. GORDON,
FRANKLIN B. DYER,
HARVEY H. BAKER.

III

ON INDIC PHILOLOGY

WILLIAM STURGIS BIGELOW,
A. V. WILLIAMS JACKSON,
PERCIVAL LOWELL,
PAUL ELMER MORE,
EDWARD W. HOPKINS,
EUGENE W. BURLINGAME.

ON THE CLASSICS

LAWRENCE E. SEXTON,
EVERT J. WENDELL,
BABSON S. LADD,
RUSSELL GRAY,
PRENTISS CUMMINGS,
W. AMORY GARDNER,
WILLIAM K. RICHARDSON,
AMOS TUCK FRENCH,
FRANCIS RAWLE,
JAMES BYRNE.

ON ENGLISH

OWEN WISTER,
ROBERT GRANT,
WILLIAM R. THAYER,
FRANCIS J. SWAYZE,
GEORGE A. GORDON,
SAMUEL M. CROTHERS,
GEORGE R. NUTTER,
ALBERT MATTHEWS,
M. A. DEWOLFE HOWE,
CHAUNCEY G. PARKER,
JAMES DUNCAN PHILLIPS.

ON GERMAN

FREDERICK P. FISH,
JAMES MONROE OLMSTEAD,
GEORGE FRANCIS ARNOLD,
EDWARD RUHL,
PAUL V. BACON.

ON FRENCH AND OTHER ROMANCE LANGUAGES AND LITERATURES

WILLIAM R. THAYER,
OWEN WISTER,
J. TEMPLEMAN COOLIDGE, JR.,
T. RUSSELL SULLIVAN,
GORDON ABBOTT,
FRANCIS MCLENNAN,
GEORGE B. SHATTUCK,
J. RANDOLPH COOLIDGE, JR.,
JAMES GEDDES, JR.,
LOUIS DOW.

ON HISTORY

FREDERICK P. FISH,
WILLIAM R. THAYER,
HENRY H. EDES,
OSWALD G. VILLARD,
JAMES SULLIVAN,
ARCHER M. HUNTINGTON,
EDWIN V. MORGAN.

ON GOVERNMENT

George Wigglesworth,
Abbot L. Mills,
Augustus E. Willson,
Charles S. Hamlin,
William Phillips,
Frederick S. Mead,
Samuel W. McCall,
Frank G. Thomson,
Thomas L. Livermore.

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Francis J. Swayze,
Charles W. Eliot,
William Endicott,
Edgar C. Felton,
John F. Moors,
John W. Morss,
I. Tucker Burr,
Robert Treat Paine,
Camillus G. Kidder,
Wallace B. Donham.

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George H. Palmer,
George A. Gordon,
Alfred T. White,
George B. Dorr,
Richard C. Cabot,
Richard H. Dana,
William R. Warren,
Joseph Lee,
Morton Prince.

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Frederic P. Cabot,
Joseph Lee,
Robert Saltonstall,
James J. Storrow,
David A. Ellis,
A. Lincoln Filene,
David Snedden,
Felix Warburg,
John F. Perkins.

ON MUSIC

Owen Wister,
Arthur Foote,
George A. Burdett,
Horatio A. Lamb,
Percy L. Atherton,
Frederick S. Converse,
Richard Aldrich.

ON MATHEMATICS

William Lowell Putnam,
George E. Roosevelt,
George V. Leverett,
Philip Stockton.

ON BOTANY

Walter Deane,
George G. Kennedy,
Edward L. Rand.

ON GEOLOGY, MINERALOGY, AND PETROGRAPHY

George B. Leighton,
Rodolphe L. Agassiz,
George P. Gardner,
William E. C. Eustis,
William Sturgis Bigelow,
Guerdon S. Holden,
Livingston Davis,
J. Walter Wood.

TO VISIT THE BUSSEY INSTITUTION

Carroll Dunham,
Walter C. Baylies,
J. Arthur Beebe,
John Lowell,
Nathaniel T. Kidder,
Augustin H. Parker,
William H. Ruddick,
Isaac S. Whiting,
Simon Flexner,
Daniel W. Field,
George Fabyan.

TO VISIT THE OBSERVATORY AND THE DEPARTMENT OF ASTRONOMY

Joel H. Metcalf,
George I. Alden,
Anna P. Draper (Mrs. Henry Draper),
George R. Agassiz,
Elihu Thomson,
Erasmus D. Leavitt,
Charles F. Choate, Jr.,
Charles R. Cross,
Frederick Slocum.

TO VISIT THE BLUE HILL OBSERVATORY

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Mrs. A. Lawrence Rotch,
William Cameron Forbes,
Livingston Davis,
William M. Davis,
Augustus Hemenway,
I. Tucker Burr,
Henry W. Cunningham,
Charles S. Minot,
Morris Gray.

TO VISIT THE BOTANIC GARDEN

Oliver Ames,
Edwin F. Atkins,
Arthur F. Estabrook,
George B. Dorr,
Ernest B. Dane.

TO VISIT THE GRAY HERBARIUM

Nathaniel T. Kidder,
George G. Kennedy,
Emile F. Williams,
Walter Deane,
George R. White,
John E. Thayer,
Joseph R. Leeson,
Susan Minns (Miss),
Mrs. William G. Weld,
Katharine P. Loring (Miss)

TO VISIT THE BOTANICAL MUSEUM

Nathaniel C. Nash,
Walter Hunnewell,
Elliot C. Lee,
David Pingree,
H. Clifford Gallagher,
Mary Lee Ware (Miss),
William Powell Wilson,
Benjamin Preston Clark,
Stephen P. Sharples,
Robert W. Atkins.

TO VISIT THE MUSEUM OF COMPARATIVE ZOÖLOGY AND THE DEPARTMENT OF ZOÖLOGY

William Cameron Forbes,
J. Collins Warren,
George P. Gardner,
Dudley L. Pickman,
Rodolphe L. Agassiz,
John C. Phillips,
J. B. Henderson, Jr.,
Louis J. de Milhau,
George R. Agassiz,
James F. Porter,
Augustus Hemenway,
William Brewster,
Alexander Forbes,
John E. Thayer,
Francis N. Balch.

TO VISIT THE PEABODY MUSEUM AND THE DIVISION OF ANTHROPOLOGY

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Charles P. Bowditch,
Augustus Hemenway,
Jesse W. Fewkes,
Clarence J. Blake,
Elliot C. Lee,
Louis J. de Milhau,
John C. Phillips,
Thomas Barbour.

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George Wigglesworth,
John W. Hallowell,
Jesse Isidor Straus,
David A. Ellis,
William Merriam Crane,
George Cabot Lee,
Abraham Koshland.

TO VISIT THE GERMANIC MUSEUM

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Clement S. Houghton,
David P. Kimball,
Edward R. Warren,
Curt H. Reisinger.

TO VISIT THE ARNOLD ARBORETUM

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Charles A. Stone,
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William C. Endicott,
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Bernhard Berenson,
Arthur Fairbanks,
J. Randolph Coolidge, Jr.,
Edward W. Emerson,
George N. Black,
Robert S. Minturn,
Felix Warburg,
William M. Ivins, Jr.,
Roger S. Warner,
Daniel F. Platt.

TO VISIT THE JEFFERSON PHYSICAL LABORATORY AND THE DEPARTMENT OF PHYSICS

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Elihu Thomson,
Samuel Hill,
Hammond Vinton Hayes,
Peter Cooper Hewitt.

TO VISIT THE CHEMICAL LABORATORIES

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Elihu Thomson,
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John D. Pennock,
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George B. Leighton,
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James Purdon,
J. Wells Farley,
William S. Hall,
William Hooper,
Samuel H. Durgin.

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William C. Boyden,
Thomas W. Lamont,
William Cameron Forbes,
John W. Hallowell,
William C. Endicott,
Grafton St. L. Abbott,
Arthur Lyman,
Richard C. Storey,
John L. Saltonstall,
Eliot Wadsworth.

No. 63

REPORT OF THE COMMITTEE TO VISIT THE ASTRONOMICAL OBSERVATORY

To the Board of Overseers of Harvard College: —

The undersigned committee appointed by you to visit the Astronomical Observatory begs leave to submit the following report.

The members have visited the Observatory and have familiarized themselves with its condition and plan of work. They find the work going on smoothly and successfully, and fulfilling to an eminent degree the purposes for which it was founded.

As you are doubtless aware no instruction is given, but all the energies of the staff are devoted to astronomical research. Many investigations are carried on, no less than forty being in progress at the present time, and especially are large pieces of work undertaken which, extending over a long period of years and requiring a large expenditure, would be impossible of success by smaller observatories and are only possible here through well considered plans and settled policies which the Director, Professor E. C. Pickering, has been able to give to them.

In former reports we have told of the honorable position which the Observatory holds, and have spoken of its results in several important investigations of the new astronomy, such as spectrum analysis and the variability of the stars. In this report we desire to bring to your attention some of its results in the closely related province of stellar photometry.

The measure of the light of the stars on an accurate scale is one of the most important but most difficult tasks of astrophysics.

The investigation is important, not only for our knowledge of individual stars, but as there is a direct relation between the light of the stars and their distances from us, photometry must be an important factor in our ultimate interpretation of the dimensions of the sidereal universe.

Among the earliest investigations in this field were those made by Professor G. P. Bond on the light of the sun, moon, and planets.

In Volume 9 of the Harvard Annals are recorded measures of 494 stars by the late Charles S. Peirce. For this investigation a

Zöllner photometer was used and many comparisons were made with the ancient Almagest, the Bonn Durchmusterung, and other catalogues.

In 1877, under the direction of Professor Pickering, astronomical photometry was undertaken as one of the principal investigations of the Observatory, and since that time the Observatory has been one of the foremost authorities in this branch of science.

Though the work has taken a very wide scope, one fundamental principle has been very generally used. The light of two stars to be compared was polarized by the use of a double image prism, and these images equalized by a Nicol prism. As the method of reversing the images was applicable to this procedure, most sources of systematic error were eliminated.

The photometers developed on this principle took three forms, as the stars to be compared were near together or in widely separated parts of the sky.

First, by moving the double image prism, a comparison of stars separated from 3″ to 7′ of arc was permitted.

Second, by the use of two movable achromatic prisms, stars separated from 5′ to 35′ of arc could be compared.

Third, by the use of two similar telescopes, it was possible to compare any two stars visible near the Meridian. This later form was called the Meridian Photometer.

By these three forms of the same general method very large results have been obtained.

In H. A. 11, Part 1, the components of several hundred double stars were measured and the first accurate scale for these objects determined.

The labors of the years from 1879 to 1882 gave 94,476 measures of 4260 stars and included all stars visible to the naked eye in Cambridge.

These results were compared with all previous catalogues and the estimates reduced to a standard scale. A similar instrument but of double the size was then constructed and with it 267,092 measures of 20,892 stars were made during the years from 1882 to 1888.

The greater portion of these stars were those whose positions were measured at two observatories in the great coöperative plan of observing all stars of the ninth magnitude and brighter, the results of which are published by the *Astronomische Gesellschaft.*

In the year 1889, the photometer was taken to the Arequipa Station of the Observatory and in the three following years 98,744

measures of 7,922 stars were made by Professor S. I. Bailey. This extended the observation of all stars visible to the naked eye over the celestial sphere.

In 1891, the photometer was brought back to Cambridge, and during the next six years 473,216 measures of 29,587 stars were made which includes all stars of magnitude 7.5 or brighter visible in this latitude. In 1899, the photometer was again sent to Arequipa and all the stars of 7.0 magnitude or brighter were observed to the South Pole.

The results of all these investigations were brought together in H. A. 50, which gives the concluded magnitude of 9,110 stars, including all those of magnitude 6.5 and brighter, and a comparison with the photometric results on the same stars made at other observatories of the world.

For fainter stars a 12-inch telescope was mounted horizontally and with it 726,952 measures were made by Professor Pickering during the years 1898 to 1910. As a check on this work every evening numerous stars measured with the 4-inch photometer were observed with the 12-inch meridian photometer so that the scale of the two instruments would agree. The results of all these investigations, which were the first systematic measurements of the light of the heavenly bodies, are among the most valuable of modern astronomy, and their value must increase with the passing of time. The 2-inch photometer furnished a scale for magnitudes of stars brighter than the seventh magnitude, the 4-inch photometer furnished a scale down to the tenth magnitude, and the 12-inch photometer the scale for those as faint as the thirteenth magnitude. The grand total of these investigations gives observations of 80,000 stars and the number of estimates, including those made with the 15-inch Equatorial, exceeds two million. The time required to make them was thirty years.

During this whole period observations were made the first part of every clear night with the 15-inch equatorial. The greater portion of these measures were made by the late Oliver Clinton Wendell, whose wonderfully precise observations of variable stars of long and short period, of the satellites of Jupiter and Saturn, of asteroids and other celestial objects, leave him a memorial which must endure for many years and link him with those who have done much to extend the bounds of human knowledge.

Great advances have also been made during recent years in the sphere of photographic photometry, and through its aid the under-

taking is well on its way to extend our knowledge of brightness to stars of the twentieth magnitude.

From all these investigations a scale of photometric magnitudes has been evolved which has been adopted as a standard by the Committee of the International Map of the Sky.

As an illustration of the usefulness and accuracy of the early photometric observations even with so small an instrument as the 2-inch photometer, it is well to point out the confirmation of the variability of Polaris. In a recent discussion of Dr. Pannekoek, it was proved that observations made as long ago as 1879–82 confirm the variation. The change is less than one-tenth of a magnitude, and yet Dr. Pannekoek showed that though the period is four days, the Harvard results represent the variation thirty years ago with an error of only a tenth of a day.

JOEL H. METCALF, *Chairman*,
GEORGE I. ALDEN,
ANNA P. DRAPER,
GEORGE R. AGASSIZ,
ELIHU THOMSON,
ERASMUS D. LEAVITT,
CHARLES F. CHOATE, JR.,
CHARLES R. CROSS.

No. 64

REPORT OF THE COMMITTEE TO VISIT THE GRADUATE SCHOOL OF BUSINESS ADMINISTRATION

To the Board of Overseers of Harvard College: —

In 1911 this Committee submitted its first report on the condition of the Business School. At that time the School had been in existence less than three years and the Committee's conclusions regarding the value of the School's work were necessarily based to a large extent on its investigation of the School's internal organization and development. The favorable expressions of opinion concerning the School received from both former students and their employers were referred to in the report but the Committee did not lose sight of the fact that at the time the business experience of former students in no case comprised a longer period than eighteen months.

Four years have passed since that report was made and during this interval the Committee has been enabled to make a more careful study of the School. Some of the members of the Committee have personally visited classes in order to secure additional first-hand information as to the spirit and thoroughness of the School's instruction. The Committee has kept itself informed concerning the subject-matter and arrangement of the courses, the methods of instruction used, and the examination questions set in the courses. It has also examined the results of a new and extensive inquiry among the graduates and former students of the School. The Committee has, therefore, been able to base its general impressions and its opinion as to the future prospects of the School upon evidence of a more convincing character than that which was available during the experimental period covered in the last report.

It is not practicable to set forth in full the very numerous reports received from former students. These reports were received in answer to a circular letter sent out by the Secretary of the Harvard Business School Alumni Association at the suggestion of this Committee. Students were asked to express themselves fully and frankly as to whether the training received in the School had proved

to be of value to them in business. There was a very generous response by them to this invitation and their replies were almost uniformly favorable to the School. One man wrote, " In the course of ordinary business it would require at least ten years to gain the experience I secured in one year at Harvard. . . . I, therefore, consider the Harvard Business School a ' concentrated experience producer.' " A business man sent the following unsolicited report about his son who was a former student in the School: " Allow me to thank you for what you have done for my son in your graduate business course. The changes in his view of life, the justified self-confidence he has acquired, the progressive conservatism testing all new things with the splendid criticism of an open and very much enlarged mind, are in my opinion wonderful, yet there is no overbearance. . . . Your course is the missing link between a college graduate and a business life. . . . I am more than satisfied. You have educated not only the son but also the father."

The demand of business firms for the School's graduates is becoming increasingly evident. Certain firms have placed a standing order with the School for the best students specializing in their particular lines. The following table giving the average earnings of former students is additional evidence, so far as it goes, of success on the part of students. The table is constructed on the basis of returns from students which are not complete yet are fairly representative. It contains the present average earnings of men who began work at the year specified and states the figures for men who have been in the School for two years and those who have had but one year.

(The year indicated below denotes the year the student left the School.)

	1914	1913	1912	1911	1910	1909
Two-year men	$1450	$1292	$1576	$1800	$2144	$ . .
One-year men	856	1233	1921	2066	1926	2471

In connection with the foregoing table it should be said that during the first few years the best men and those who had positions waiting for them remained but one year in the School. It is interesting, however, to observe the steady increase in salary of the two-year men compared with the uneven record of the one-year men; and also the high average salary received by the twenty-eight men in last year's graduating class.

The statistics of enrolment in the School have shown thus far a marked preponderance of men remaining but one year. This was to be expected in the earlier years of the School until the advan-

tages of the second year had been realized. In this respect the experience of the Law School in establishing a three-year course has been paralleled in the Business School. The natural impatience of young men to enter as soon as possible upon their careers, together with opportunities frequently open to the men after one year, largely explain the smaller number returning for the second year. It is the uniform experience of the men who stay here two years, however, that the training of the second year is far more valuable than that of the first. The number of men returning for the second year is increasing both relatively and absolutely.

The coöperation of business men in the work of the School has greatly benefitted the School, and affords evidence of the regard in which the School is held by them. This spirit of coöperation is manifested in a variety of ways. Aside from the opportunities created by them for permanent and summer employment of students and for investigation of their plants as a feature of the School's instruction, many of them are rendering direct and personal assistance in the work of the School. They are doing this not merely by giving lectures on their specialties but by their service on advisory committees which have been formed to assist in the guidance of some of the courses in the School, and by their willingness to aid in the work of the Bureau of Business Research.

The reports annually submitted by the Dean of the School to the President of the University contain statistical tables regarding the rapidly increasing student body of the School, and statements of the changes and additions which are being made from time to time in the courses of instruction, as well as other matters of interest relating to the internal development and activity of the School.

The enrolment shows a gratifying growth and attests the School's standing as a national institution. In the last three years, the number of regular students has doubled, while the states represented have increased from twenty-one to thirty-five, and the different colleges from twenty-five to sixty-four. The enrolment statistics from 1908–1915, inclusive, follow:

Year	Students doing full work 1st yr.	2nd yr.	Specials	Total Enrolment	States represented	Foreign Countries	Colleges represented
1908–09	33	..	47	80	12	3	14
1909–10	42	8	41	91	16	5	19
1910–11	43	10	41	94	20	2	22
1911–12	55	10	32	97	21	4	25
1912–13	77	11	32	120	26	4	42
1913–14	67	32	18	117	28	3	47
1914–15	107	27	29	163	35	4	64

In general, the Committee has been impressed with the skill and judgment used in modifying old courses and introducing new courses with the design of making the instruction increasingly practical. It has also been impressed with the resourcefulness of the authorities in accomplishing these ends without imposing upon the School any considerable added expense. While approving the experiments the School has been making with courses of a quasi-technical character, training men for particular businesses, the Committee believes that the chief emphasis in instruction should continue to be laid on fundamentals, as exemplified in such courses as those in marketing, factory management, accounting and statistics, business policy and finance.

In this connection it is interesting to note that in the teaching of the School increasing attention is being given to the vital human relationships in business. The Committee feels that it is desirable to give increasing attention to the study of the great modern problems of labor and of relations between government and business.

The Committee is convinced that the School is offering a professional training of high usefulness for future business men. That this is the conviction of the governing boards of the University was shown by their attitude in 1913 in placing the School upon a permanent foundation under the charge of a Faculty of its own. The Committee believes, after carefully considering all data available to it, that the School is now filling, and is destined to fill, an important place in the United States in training men to enter business life with a higher standard of business ethics and better equipped to promote sensible and workable relations between government and business. Indeed, the only respect in which the ambitions of the School have not been fully realized is in the size of its endowment at the present time. The Visiting Committee is glad to report, however, that since the last report to the Board of Overseers there have been received the Edmund Cogswell Converse Fund with a principal of $125,000 for instruction in banking and finance and the Isidor Straus Fund with a principal of $10,000 for instruction in " commercial practice and business organization." Business and financial conditions in this country have not been propitious in recent years for securing additional funds, but it is the confident belief of this Committee that the School has so thoroughly proved its worth that this deficiency in its finances will be overcome as soon as general business conditions become more favorable, and that friends of Harvard, and supporters of the theory

of the Graduate School of Business Administration, will provide shortly the necessary sums to place one or more professorships on a permanent basis.

HOWARD ELLIOTT, *Chairman*,
CHARLES W. ELIOT,
WILLIAM C. BOYDEN,
J. PIERPONT MORGAN,
THOMAS W. SLOCUM,
THOMAS W. LAMONT,
JOHN W. HALLOWELL,
A. SHUMAN,
WALTER C. BAYLIES,
THOMAS K. CUMMINS,
CHARLES H. JONES,
ADAMS D. CLAFLIN,
JAMES F. CURTIS,
JOHN S. LAWRENCE,
HERMANN F. CLARKE.

April 12, 1915.

No. 65

REPORT OF THE COMMITTEE TO VISIT THE CHEMICAL LABORATORY

To the Board of Overseers of Harvard College: —

Your Committee to Visit the Chemical Laboratory held its annual meeting at the Wolcott Gibbs Memorial Laboratory on February 20th, 1915. It was joined by the President of the University, Mr. A. W. Longfellow, Architect of the Gibbs and Coolidge laboratories, Mr. Roger Pierce, Secretary to the Corporation, and the members of the Chemical Staff.

Your Committee was again impressed with the necessity for additional and more modern laboratory facilities for the use of the Division of Chemistry, which are not already provided for by the Gibbs and Coolidge buildings, if it is to keep pace with the demands upon the College in this direction.

The Division Staff reports that the Wolcott Gibbs Memorial Laboratory for research in physical chemistry and the T. Jefferson Coolidge Jr. Memorial Laboratory for quantitative analysis have proved eminently satisfactory in every way. The opportunity of working in clean, quiet and healthful surroundings is highly appreciated by both students and instructors. Unfortunately these two buildings only begin to relieve the situation, for together they accommodate less than one hundred out of the nine hundred laboratory students. The main mass of undergraduate students must still be quartered in Boylston Hall. The Committee and the Division feel that there is urgent need of a new large building to accommodate the main mass of undergraduate students of chemistry.

It was pointed out at our meeting by the Staff that chemistry was third in numerical order of subjects chosen for concentration during the present year. The number of students electing chemistry still continues to increase, particularly as regards the laboratory courses. In consequence, the accommodations provided are inadequate for the number of applicants in some of them.

As pointed out in the report of your Committee for 1914, students of chemistry, at present, labor under the handicap of heavy

charges for laboratory facilities and material. Your Committee agrees with the recommendations of the Division that, in case the college tuition fee is raised, no laboratory fee should be charged in chemical courses, and that apparatus and special material used should be furnished at cost, exclusive of overhead expenses. It was also suggested that, on this account, appropriations for the laboratories should be on the basis of the number of students, or the student hour, since a sharp increase in enrolment is likely to follow the abolition of fees.

The importance of the subject of chemistry and the increasing interest shown therein by students seem to warrant an increase in the personnel of the Division also.

Your Committee would recommend that your Board give very serious consideration to the present condition of the Division of Chemistry and to means of improving it.

It is suggested that in the future the Committee should be designated " Committee to Visit the Chemical Laboratories," in view of the fact that there are now three under the control of the Division.

CLIFFORD RICHARDSON, *Chairman.*
ELIHU THOMSON,
C. H. W. FOSTER,
JOHN D. PENNOCK,
ALEXANDER FORBES.

April 12, 1915.

No. 66

REPORT OF THE COMMITTEE ON GEOLOGY, MINERALOGY, AND PETROGRAPHY

To the Board of Overseers of Harvard College: —

The Committee on Geology, Mineralogy and Petrography met on January 30th. There was a large attendance of the Committee together with the instructors of the department. A full discussion took place as to the progress which had been made in developing the department in breadth and character of work. Figures obtained from the College office showed a continuing and gratifying increase in students of over twenty-five per cent, and with the establishment of several new courses it is quite probable that this percentage of growth can be maintained. No student can claim a general education without some knowledge of geology, mineralogy or climatology, and with competent instructors not a few students will continue from the elementary courses into the advanced courses either as a preparation for his life's work or for love of the science.

As stated in the last report of this Committee, the most pressing need is that of clerical aid, that the time of instructors may not be occupied in attending to much which can be as well if not better done by a competent clerk and stenographer. The expense is comparatively slight and it should receive attention on the part of the Corporation at the earliest possible moment.

Arrangements have been made, originally by personal sacrifice on the part of several instructors, so that the mineral cabinet and economic geology exhibits are kept open daily. It is surprising to learn that the visitors now number about two hundred a day.

A summer course in stratigraphy has been given in Montana for years by Professors Woodruff and Palache. This year a complementary course in field geology will be given by Professor Atwood in southwestern Colorado. The Montana course comes early in the summer, the Colorado one later, so that both may be taken by a student if he so desires during one vacation, each counting for half a course for his degree. The friendly assistance of several members of the Committee has enabled the Colorado course to be given.

Nothing definite has been learned as to when any of the money from the Holden bequest is to be received. It is hoped the receipt

of it will not be long delayed, for there are many urgent needs of the department which in the present state of college finances it would be unbecoming to press upon the Corporation.

Late last spring an understanding was arrived at with the College so that, in event of the proposed alliance with Technology, certain laboratories and lecture rooms would be transferred to Pierce Hall, not only adding much room for other work of the department in the present Museum building but of lessening the fire hazard to the valuable collections by having the laboratories removed.

Forecasting of weather and storm conditions at Blue Hill seems to be considered of real commercial value by certain interests, such as railway managers, that they may be saved from moving perishable freight or heavy tonnage just before a heavy winter storm, and by department stores, that they may not advertise extensively at an improper time. No doubt electric railways and cities would gladly pay for information as to probable excessive snow fall. The status is now that the Observatory answers inquiries but it does not give the information unless sought. The question arises whether some remuneration should not be arranged for such service just as a fee was charged by observatories for rendering standard-time service before it was done by the government gratuitously.

The Blue Hill Observatory has also begun the systematic dissemination of frost forecasts in the cranberry region of southern Massachusetts, and so the expansion of usefulness of this institution continues, which is only made possible by the devotion of its immediate friends.

A notable enthusiasm and *esprit de corps* is noted in the staff, which is of much value and quite in contrast to the lack of such feeling some few years ago.

The Committee has made several suggestions as to work which it is hoped may be the subject for discussion in next year's report.

W. E. C. EUSTIS,
GEORGE P. GARDNER,
J. WALTER WOOD,
LIVINGSTON DAVIS,
G. S. HOLDEN,
W. STURGIS BIGELOW,
R. L. AGASSIZ.
GEORGE B. LEIGHTON, *Chairman.*

April 12, 1915.

No 67

REPORT OF THE COMMITTEE TO VISIT THE DEPARTMENT OF ECONOMICS

To the Board of Overseers of Harvard College: —

The Committee to Visit the Department of Economics respectfully reports:

The most important change during the year has been in the conduct of Courses 1*a* and 1*b*, which are now introductory courses in accounting and statistics, designed to give these subjects vital and fundamental relation to the students' later work in economics. Both courses are given by effective teachers with a large amount of what may be called laboratory practice or problem work, which seems to be extremely valuable. Next year the Department is to have at its disposal one of the drafting rooms at Pierce Hall, which will furnish an admirable laboratory.

The interest shown in Professor Carver's course in the Economics of Agriculture is surprising. There are forty-four students in this course and as many more were refused admission either because of their inadequate preparation or of their lack of practical interest in the subject. Most of the students electing this course have either come from farms or are contemplating farming or some other form of rural work. The number in the class has been strictly limited because of the difficulty in providing satisfactory reading matter in sufficient quantity. Professor Carver now has in preparation a book of selections bearing on the general question of rural economics and agricultural policy which will be available for use next year and render it unnecessary to restrict the members in the course arbitrarily.

Professor Carver is in Cambridge this year but continues to direct the investigation which the Department of Agriculture is making into the subject of the marketing of farm products. As no member of the teaching force is away on leave, the work this year has been unusually free from interruption. The number of graduate students continues to increase. This year it was forty-eight, and the prospect is of further growth. The attendance in other courses has been normal, but the re-adjustments made in Courses 1*a* and 1*b*

have brought about a considerable reduction in the number taking these courses, the result of which is a slight decrease in the number taking all courses in the Department. This is no more variation than is to be expected from year to year.

Plans are under consideration for introducing in Economics 2*a*, European Industry and Commerce in the Nineteenth Century, and 2*b*, Economic and Financial History of the United States, improved supervision of the work of the students in preparing and writing theses, in line with the effort now making to improve the quality of English written by students in Harvard College.

The Department has been obliged, during the year, to furnish the assistance of tutors to those of the present Sophomore class who were concentrating in economics, and thus to add three tutors to the staff. Three others will be appointed next year, and it appears possible that by combining these positions with those of instructors and assistants we shall be able to offer somewhat better compensation for the work and thereby secure a better type of instructor and assistant.

The Department of Education has continued this year its survey of the Department of Economics and has inspected the work of practically all the courses. The Department of Education expects to bring this work to completion next fall, and the report may be expected by November 1st.

Respectfully submitted,

FRANCIS J. SWAYZE,
CHARLES W. ELIOT,
WILLIAM ENDICOTT,
EDGAR C. FELTON,
JOHN F. MOORS,
JOHN W. MORSS,
I. TUCKER BURR,
ROBERT TREAT PAINE,
CAMILLUS G. KIDDER,
WALLACE B. DONHAM.

May 10, 1915.

No. 68

REPORT OF THE COMMITTEE TO VISIT THE DEPARTMENT OF THE CLASSICS

To the Board of Overseers of Harvard College: —

The Committee appointed by the Board of Overseers to visit the Department of the Classics respectfully reports as follows:

Since the last report, formal and largely attended meetings, at which the members of the Committee and the Faculty members of the Department were present, have been held on June 7, 1913, March 3, 1914, and February 27, 1915. At the meeting held March 3, 1914, President Lowell and Mr. Robert Bacon, representing the Corporation, were present. The Committee also met on May 8, 1915, for the purpose of discussing and formulating this report. Informal meetings and discussions and correspondence between members of the Committee and of the Faculty and others have taken place from time to time.

During the past ten years or so there has been a decrease in the proportion and numbers of undergraduates electing and "concentrating" in "classical courses." Thus from 1903–04 to 1912–13 the elections of classical courses fell from 668 to 372; elections of such important courses as Latin *B* from 143 to 82, and of Greek *B* from 72 to 26; the number of Freshmen electing both Latin and Greek from 60 to 13 (of whom those electing both Latin *B* and Greek *B* or some equally important combination of the two languages fell from 50 to 6), and so on.

Correspondingly the awards of Final Honors and Second-Year Honors for the corresponding years show a falling off in Final Honors from 6 in 1903–04 to 2 in 1912–13, and in Second-Year Honors from 11 in 1903–04 to 1 in 1912–13.

Roughly speaking, one may say that during the ten years in question there has been a falling off of much more than fifty per cent in the number of undergraduates who have specialized in the Classics. This falling off, which the Committee cannot but regard as deplorable, is undoubtedly due to a variety of causes, — partly to the popular trend of recent years away from the Classics and toward scientific and vocational studies, partly to the competitive inducements held out by other colleges through the partial or

entire abandonment of Latin and Greek as requirements for admission, and the adaptation of the secondary schools to such modified requirements, partly to the popularity among the undergraduates of those subjects which are included in Group III (History, Government, and Economics) — but during the four years preceding the current year largely to the restrictions and limitations heretofore imposed by the somewhat rigid group system as at first devised, which seriously interfered with, if it did not practically prohibit, concentration by the average Freshman or Sophomore in both Latin and Greek.

Seventeen courses are required for the degree of A.B., five in the Freshman year and four in each of the other years. The courses for undergraduates are divided into four groups: Group I includes all languages, ancient or modern, and also all courses in Fine Arts, Architecture, and Music, and constitutes at least one-third and very nearly one-half of all the courses open without special permission to undergraduates; Group II includes the Sciences; Group III, courses in History, Government, and Economics, and Group IV, Philosophy and Mathematics.

Each student is required to select six closely related courses from one of these groups for concentration, and to distribute six of his other courses among the remaining groups in such manner as to have at least one in each group and not less than three in any two of these groups. Under the foregoing system, previous to this year, it was barely possible for a student to elect both Latin and Greek in his first two years, and he could not possibly take in addition the courses in composition which would have enabled him to become a candidate for Second-Year Honors, nor could he distribute any of his work during those years in either Group II or IV; for the reason that of the nine courses taken by him in his first two years it was practically necessary that he should take five as follows:

English *A*, prescribed for all Freshmen.

French or German, prescribed for all Freshmen who have not presented the courses in both for admission to college.

One or two of the courses in Group III, History 1, Government 1, or Economics 1; because no student is admitted to a higher course in any of these subjects until he has taken the lower one, and because History 1, and ordinarily Government 1, must be taken in the first two years in order to count as full courses.

One or two electives in French or German; because a rule of the Faculty requires that before entrance to the Junior Class a student must pass a test in either French or German, and the students

regard the test as so serious a one that the great body of them feel compelled to elect one or two courses in those languages.

To meet the difficulties imposed by the group system and rules above referred to, various changes and modifications were suggested and discussed by this Committee: (1) the abolition of the group system and a return to the former freedom of election, with certain prescribed courses; (2) the retention of the group system and requirements as to concentration, and the abolition of all requirements as to distribution; (3) the creation of a large number (say 20 or 30) of groups of suggested courses which could be begun in the Freshman year and carried through the entire college course; (4) the subdivision of Group I into two or more groups, one to include the Classics (Latin and Greek) and the other to include the other subjects now in that group, with some more liberal provisions for distribution, and (5) the inclusion of some of the courses now limited to one group in more than one group (as, for example, certain courses in Latin and Greek historical writers) so that they might be counted for distribution as well as concentration.

As bearing upon these questions it may be said that your Committee is informed that all the members of the Faculty of Arts and Sciences are heartily in favor of the requirements as to concentration, but a large number — said to be about fifty per cent — do not believe in the requirements as to distribution. All of the Faculty members of the Classical Department are strongly opposed to these requirements as to distribution and believe that they should be entirely given up, so as to allow perfect freedom of choice for distribution, or at least greatly relaxed. It is claimed that they have a bad effect in leading Freshman "Advisers" to discriminate against the Classics in laying out courses for Freshmen, and that the latter having once given up the idea of concentration in the Classics during the Freshman year, will not thereafter renew their interest therein. There seems also to be much opposition to the requirements as to oral examinations in French and German, for admission to the Junior Class (recently modified so as to permit a written examination at the beginning of the Junior year), as tending further to restrict the opportunities for distribution and so to militate against the Classics. These are broad subjects, however, which concern the general policy of the University, rather than any one department, and your Committee expresses no opinion as to the views above referred to. They would seem, however, to be entitled to the serious consideration which they doubtless have received or are now receiving.

It was the general opinion of the Committee, last year, that with the group system, substantially as at present devised, some means should be found for relaxing the rigidity and stringency of some of the rules so as to allow greater freedom of choice in order that those who wished to concentrate in Latin and Greek could do so more readily and effectively.

Following the discussions at last year's meetings, the Faculty Committee on the Choice of Electives undertook for this year to make the group plan somewhat more elastic, so far as distribution is concerned; and whenever a Department interested in a particular man feels that the strict requirements of distribution are likely to hamper him, it will find the Faculty Committee on the Choice of Electives ready to make large modifications of the distribution rule, so that the concentration may be thorough. As applied to the Classics the following formal announcement was printed in the pamphlets sent out at the beginning of the year to all incoming Freshmen regarding their choice of studies:

"If a student feels a strong interest in any one field of thought he will do well to devote himself largely to that field in his Freshman year and may choose even three courses in it if he so desires. He would do well to ask for some adviser acquainted with that field."

And again:

"Students concentrating in the Classics are advised to take in the Freshman year Greek *B* and Latin *B*, and if they are candidates for honors in the Classics, Greek *E* and Latin *E* in addition. The requirements for distribution can readily be fulfilled in later years."

So, too, the pamphlet of the Department of the Classics contains the following: —

"Students concentrating in the Classics may select such courses as they need for a thorough study of the subject, without necessarily distributing six courses in the other groups. In their Freshman year they should ordinarily take Greek *B* and Latin *B*.

"Those who desire to become candidates for Second-Year Honors, should take, in addition, Greek *E* and Latin *E* (the courses in composition), and these courses are recommended also to candidates for the degree with distinction."

The Committee is hopeful that these modifications in the administration of the rules may result in some improvement and increase in the numbers of those who will concentrate in the Classics and that they will bring helpful encouragement to all who are interested in that Department. The Committee will watch with interest the result of these modifications and report further when a sufficient

time has elapsed to enable it to form a careful judgment on the subject.

It is not in this country alone that interest in the Classics has waned in recent years — Germany, under the influence of the present Kaiser, and France, have both suffered in this way.

In France, according to a recent writer (Ernest Dimnet), the study of Latin and Greek, which had weakened after the Franco-German war of 1870, received a severe blow in or about the year 1902, when through legislation "the old course of studies was replaced by a completely different one, the chief feature of which was a quadruple subdivision making Latin and Greek optional, while sciences and modern languages never were." In the course of a few years the practical results of this change, showing a deterioration in the training and mentality of students and their lesser fitness for advanced work, and amounting not only to a "crisis in French culture but a crisis of the French language as well," led to a strong reaction against "Scientism" about 1910 — this reaction being led by "Scientists, Physicians or Engineers." Professors in the lycées, examiners for the *baccalaureat*, the French Academy, the Société des Gens de Lettres, the Ligue des Amis du Latin and the Ligue pour la Culture Classique complained of the abandonment of, and advocated a return to, the teaching of Latin and Greek. As a result of this agitation, although the decrees of 1902 have not been repealed, the influence of the parents has been felt, and "at the present moment 9 per cent more boys take Latin than before the reform of 1902 — and it becomes shameful once more to be foreign to the classical culture."

The experience of France is well illustrated by what has been observed at Princeton — as shown in an article by Dean Andrew F. West, printed in the *Educational Review* for March, 1914: —

"Princeton gives three Bachelor degrees — in Arts, Letters, and Science. In all three there is the following common substratum of prescribed school and college studies: Latin, English, History, Mathematics, Science, and Philosophy. Greek, as stated, is also required for the degree in Arts, but not in the other two — the omission of Greek being offset by special requirements in the sciences and modern languages."

An exhaustive and detailed statistical investigation made at Princeton for the six academic years 1906–07 to 1911–12 inclusive, the details of which, as set out in Dean West's article, are most interesting, showed that

"Apart from three insignificant exceptions in detail, candidates for the degree of Bachelor of Arts in all the considerably attended courses taken

in common with candidates for the degree of Bachelor of Letters and Bachelor of Science are in the lead of the others both in the percentage of first-group men (the highest standing) and also in average standing in all such courses in philosophy, history, politics, economics, art and archaeology, Latin, German, French, and English. In this class of courses, in mathematics candidates for the degree of Bachelor of Arts practically tie the others; in physics they lead in one course and in the other come second to the Bachelors of Science; in chemistry they fall behind slightly; in geology they do slightly better than the others, and in biology just about as well as the others.

"It should be added here that the Registrar's records also show that in the advanced electives of Senior year (so far as taken in common) the A.B. candidates lead in every course in mathematics, have a slight advantage in physics, a clear lead in chemistry, a slight lead in geology, and are somewhat behind the others in biology. Thus by the end of Senior year the A.B. students on the whole go ahead of the others in the sciences, except in biology."

An encouraging indication of an effort to increase the interest in the study of Latin and Greek at Harvard may be found in a recent report of a Committee of the Faculty appointed to consider the communication of the Board of Overseers concerning the formulation of a plan for bettering the written and spoken English of Harvard students. In that report the Committee laid special emphasis upon the value of Latin and Greek as a means towards such improvement.

We believe that through coöperation with those interested in the study of the Classics in other colleges and elsewhere, by means of popular lectures and addresses, magazine and newspaper articles, and otherwise, much might be done to revive and stimulate an interest in the study of Latin and Greek, not only at Harvard, but throughout the country, and we feel sure that our Department of the Classics will be glad to do its part in this important work.

The Committee has no specific recommendations to make at this time. Appended is a tabulated statement of statistics upon which this report is in part based.

All of which is respectfully submitted.

LAWRENCE E. SEXTON, *Chairman*

May 10, 1915.

I. Number of Freshmen candidates for A.B.

II. Election of Latin courses by Freshmen on the basis of full courses, and percentage to number of Freshmen.

III. Elections of Latin *B* by Freshmen, and percentage to number of Freshmen.

IV. Election of Latin *B* (all classes) and percentage to number of Freshmen.

	I	II		III		IV	
			%		%		%
1900–01	537	155	28.9	143	26.6	155	28.9
1901–02	551	158	28.6	138	25	147	26.6
1902–03	608	161	26.4	134	22	151	24.8
1903–04	556	139	25	117	21	143	25.7
1904–05	545	118	21.6	109	20	136	24.97
1905–06	488	111	22.7	104	21.3	125	25.6
1906–07	605	147	24.3	139	22.9	152	25.1
1907–08	531	129	24.3	119	22.4	134	25.2
Average eight years			25.2		22.6		25.85
1908–09	513	110	21.4	103	20	122	23.7
1909–10	578	132	22.8	119	20.5	130	22.4
Average ten years			24.6		22.17		25.29
(New Rules, Group System, adopted.)							
1910–11	605	91	15	83	13.7	93	15.3
1911–12	653	111	17	99	15.1	102	15.6
1912–13	565	78	13.8	72	12.7	82	14.5
1913–14	523	83	15.8	73	13.9	77	14.7
Average four years			15.4		13.8		15.02
1914–15	615	111.5	18.13+	94	15.28+	103	16.74+

No. 69

REPORT OF THE COMMITTEE TO VISIT THE PEABODY MUSEUM AND THE DIVISION OF ANTHROPOLOGY

To the Board of Overseers of Harvard College: —

Your Committee has visited the Peabody Museum, the Anthropological Section of the University Museum, and has met and consulted with the professors and teachers in the Division of Anthropology, giving instruction to undergraduates and to students in the Graduate School of Arts and Sciences.

Completion of the Museum Building. — Your Committee takes satisfaction in stating that the south wing of the University Museum is now completed, making one continuous structure; the main building fronting on Oxford Street and the north and south wings running to Divinity Avenue. The south wing, 200 feet in length, is entirely for the Peabody Museum. Thus the museum building as planned by Louis Agassiz, and begun in 1859, is now finished. The completion of the building has doubled the space for exhibitions in the Peabody Museum and has given the needed workrooms, laboratories and offices, and a large space for the research collections which are not put on exhibition. A convenient lecture room and a library with its students' reading room have been made by changes in the older portion of the building. All this has been accomplished by the gifts of friends amounting to $100,367.50.

The Museum. — This addition of space for the Peabody Museum provides three halls, each 100×60 feet, two of which are surrounded by wide galleries. These halls and galleries are to be used for the exhibition of the thousands of specimens which have been in storage awaiting the completion of the building. There is also to be considered the annual accessions that will come in from the special explorations carried on by the Museum, from the numerous gifts and from purchases of important specimens from time to time, required to fill existing gaps.

In order to utilize these new halls and place all this valuable material on exhibition in accordance with the system established by

the Peabody Professor, upon which the arrangement of the Museum is based, cases must be provided for all the new halls and galleries. As the very limited income of the Museum will not permit the expenditure of more than $500 a year for the construction of cases, and as the sum of about $50,000 is required for this purpose, it will be seen that the Museum is still dependent upon friends of the University and cannot make use of its new halls until they are gradually furnished with cases as the money is obtained for this purpose.

The safe and easily accessible arrangement of the large amount of material not exhibited, but invaluable for research and comparative study, has also to be considered. Already there are dust-tight stack-cases in the basement rooms of the older portion of the building where 2700 wooden trays of the standard size are arranged as drawers. There are now also, piled one on top of the other, over 2000 of these trays of specimens. To get at any specimen in this pile often requires the moving of fifty or more trays. This is not only a great loss of time, but also is attended with the risk of breakage of specimens. In the new basement there is a large well-lighted space about 70 × 30 feet which is planned for the gradual erection of stack-cases for these trays and for others that will be added from time to time. To build a portion of these cases sufficient for immediate requirements will cost about $2000 and this is one of the important needs to be supplied in order to facilitate the work that is going on. The Museum is primarily a place for research and all its collections must be systematically arranged for that purpose, those on exhibition being supplemented by those in the stack-cases.

The exhibits are arranged in regular sequence, each hall being assigned to a certain geographical area. The arrangement is carried out in the ethnological halls by the grouping of tribes or distinct peoples. In the archaeological collections the arrangement is the grouping of all objects from a burial place, a mound, a cave, a village site, or from a small distinctive area. The special culture of a people, a tribe, or of that shown by a prehistoric site, can thus be studied as a whole, while a comparative study can be made between one group and another. This has been the basis of arrangement in the Museum from the beginning, and it has made the study of the collections of interest to students in the University, even if not connected with the Division of Anthropology. It is also instructive to the public, which is freely admitted to all the exhibition halls.

The collection of several thousands of human skulls and skeletons, secured largely by the Museum exploring expeditions in America, and from other parts of the world by gift, exchange and purchase, is for the present in old cases and trays in two rooms and the hallway on the fifth floor, and in trays in the basement. A large collection of American skeletons from an exploration of three years ago is still unpacked, owing to lack of a proper place to put them; and over 500 skeletons from Egypt, received from Dr. Reisner's explorations, are still in the boxes in which they were received, although they have been catalogued. To make all this important osteological material of ready access for instruction, research and comparative study, a large number of special trays with cases for their reception is essential. To do this the sum of $1000 is required, and there is no more pressing need at this moment than the arrangement of this collection.

Publications. — The Museum has published five complete volumes and one number of its elaborately illustrated quarto Memoirs; five volumes and one number of its octavo Papers, also illustrated, and four volumes of its Reports, many of which were accompanied by illustrated special papers. Since the twenty-fourth Report, these have been simply brief administrative reports printed in the Report of the President and Treasurer. It also issues special publications, one of which is the reproduction in colors of an ancient Mexican codex.

These numerous publications have been issued at a large cost which has been met by the subscribers to the Central American Fund for exploration, by a few friends who have provided for the publication of special papers or volumes, and from sales. Owing to the uncertainties attending this method, the Museum has not been able to publish many papers based on its explorations and on researches made within its walls. Several papers are now awaiting the means for publication. It is therefore very desirable that a Publication Fund should be secured, the income to be used for the printing of papers and memoirs prepared under the direction of the Museum.

Instruction and the Library. — The Peabody Museum is essential to the instruction given in anthropology. With the exception of the largely attended Course 1, on general anthropology, intended specially for undergraduates above the grade of Freshman, held in the lecture hall in the Semitic Museum, all the courses and consultations are given in the lecture room in the Peabody Museum,

in the somatological laboratory, and in the offices of the professors and instructors provided by the Museum. We find that the lecture room is well furnished with sliding screens for maps and diagrams, and with a lantern and a large number of lantern slides which are essential to the proper presentation of subjects of the lectures.

The new library of the Museum gives a commodious reading room for the students in the Division. In the basement under the reading room and in special wall cases in the room there are 5,721 bound volumes and 5,928 pamphlets on anthropology, all catalogued and arranged in the cases and stacks. The current numbers of anthropological publications are readily accessible on the shelves in the reading room. The attendants in the library furnish the students with the required reading matter. This library, which is primarily for the use of the officers of the Museum, and is maintained at the expense of the Museum, is thus made available to the students in the University. It is particularly rich in the current publications of the various anthropological societies, museums and journals the world over. It also works in harmony with the University Library to avoid duplication and to provide all essential works upon the several subjects included under anthropology in one or the other of the libraries. The division of folk-lore is in the University Library.

There are also small collections of specimens in the lecture room for the illustration of special subjects by the teacher. The students use the collections on exhibition in the Museum for the required special reports in their courses, while advanced students have the use of the laboratories and work-rooms for carrying on their researches under the instructors and officers of the Museum. The officers of instruction are also appointed Curators in the several sections of the Museum.

It will thus be seen how intimate the connection is between the Museum and the instruction given in the University. In fact, without the facilities offered by the Museum, which led to the establishment of the Division of Anthropology in the University, instruction could not be carried on with such great advantage to the students.

Your Committee is of the opinion that there is no other university in the country where greater facilities are provided for instruction in anthropology, and where men can be so well trained to become professional archaeologists and ethnologists. The opportunities given for field work in connection with the exploration carried on by the Museum are also of importance to the student.

In the ten courses given this year there are 167 students, of whom 98 are in Course 1, or General Anthropology, which is attended by undergraduates not including Freshmen. In the other nine courses the students are of the higher classes and graduates. There are four graduates now taking courses for the Doctor's degree in anthropology, and five others who are taking one or more courses as a part of their preparation for the Doctor's degree in other departments. Two courses are also given at Radcliffe College which are attended by 19 students.

We have called special attention to this connection of the Museum with the Division of Anthropology, as we believe that it is not generally known to the Overseers how essential the Museum has become to the University.

Financial. — The income of the invested funds of the Museum is so small that were it not for the continued generosity of its friends it would be impossible to carry on its important work in so many lines.

The Museum has now become so large and so important to the University both as a place of research and as a place for the instruction of students, that its funds are inadequate for its proper support, and particularly for the payment of the salaries of its officers and assistants, and for the publication of the results of research. The University pays for the repairs, care, cleaning, heating and lighting of the building. Its heating plant is used for heating the Semitic Museum and the two new Chemical Buildings which are near by.

That the present financial condition of the Museum may be understood, and how its friends have come to its assistance since it was established by the gift of $150,000 from George Peabody in 1866, the following statement is made.

The George Peabody Fund of $150,000 was divided by the donor into three funds. The sum of $60,000 was to accumulate until it reached $100,000, when it could then be used for a building upon land provided by the Corporation. The first half of the building was erected from this fund and, with the addition of various gifts, cases were provided in this portion at the total cost of over $140,000. After this was done there was a balance of the accumulated income which has been kept as a special fund, the income being used for the general purposes of the Museum. Another portion, $45,000, was designated by Mr. Peabody as the Professor's Fund and the income of this was paid to the Peabody Professor until 1909, when he became Professor Emeritus and Honorary Director of the

Museum. The income of this fund has since been used for the general purposes of the Museum. The third portion of $45,000 was designated for the care and increase of the collections. Both this and the Professor's Fund have been slightly increased by the addition of income during the early years of the trust.

The Peabody funds and those that have since been added stand as follows on the books of the Treasurer of the University:

Peabody Professor's Fund	$47,335
Peabody Collection Fund	47,335
Peabody Building Fund	28,355
Huntington Frothingham Wolcott Fund	20,000
Henry C. Warren Exploration Fund	10,000
Susan C. Warren Fund	5,000
Mary Hemenway Fund for Archaeology	45,000
Henry W. Haynes Fund for the Library	1,000
Francis C. Lowell Memorial Fund	1,000
Ropes Fund. (This is the balance each year after another payment has been made, and the amount varies. The present year this is $788)	788
Thaw Fellowship Fund	30,000
Hemenway Fellowship Fund	13,000
Winthrop Scholarship Fund	6,000

Of these permanent funds the income of $205,025, with the addition of amounts from the Ropes Fund, can be used for paying salaries, for the care and increase of the collections and for explorations. The income of $49,000 is for fellowships and scholarships and cannot be applied to museum purposes.

In addition to these permanent funds there have been received since 1881 to March 1, 1915, as special gifts for current purposes, particularly for explorations, publications and salaries, over $246,000. This sum does not include the recent gifts, with interest, of $100,367.50 received for the completion of the Museum building during the past year.

It will be seen from this statement that the Peabody Museum has been active in all of its many undertakings, and that since it was started in 1866, by the exhibition of a small collection of stone implements in a single case in the Anatomical Museum, then in Boylston Hall, it has grown to a large Museum, and a valuable asset of the University in many ways. It has always struggled under many difficulties, particularly those attending a pioneer institution which had to win its way to support by showing its importance to the University, to science and to the public. It has now a building adequate for its requirements for years to come, but

its present needs are many as shown in this brief presentation. It is the hope of your Committee that these needs will be supplied by the generous friends of the University, few of whom have thus far realized the importance of the Museum and what it has done and is doing for instruction in the University and in providing for research in fields of exceptional interest.

Your Committee ventures to suggest that an effort should be made to help the Museum by providing for its necessities as here set forth. A few friends are sending annual contributions in aid of some line of work in which they are specially interested, and it would be a welcome help and great benefit to the future of the Museum if this number could be increased. We earnestly hope that the pressing needs of the Museum will soon be met by generous friends of the University.

Respectfully submitted,

CHARLES P. BOWDITCH,
AUGUSTUS HEMENWAY,
JESSE W. FEWKES,
CLARENCE J. BLAKE,
ELLIOT C. LEE,
LOUIS J. DEMILHAU,
JOHN C. PHILLIPS,
THOMAS BARBOUR,
LANGDON P. MARVIN, *Chairman,*
Committee.

MAY 10, 1915.

No. 70

REPORT OF THE COMMITTEE ON BOTANY

To the Board of Overseers of Harvard College: —

Since the last report of your Committee on Botany, meetings with the Department have been held yearly and the methods of instruction and the various needs have been freely discussed.

At the last meeting in May, 1915, the Committee were gratified to hear the generally good reports as to the number of students in the various courses, and the good work accomplished both by the undergraduates and by those taking special courses of research.

In regard to the needs of the Department special attention should be called to one serious defect which militates strongly against the high standard which should be maintained by the College in the keen competition which now exists between the many institutions in the country. This defect is the necessity of turning over the direction of the laboratory work in Botany 1 to untrained assistants. Much time is taken up in training these men, but, as a rule, this must be done all over again with a new set of men the following year. These assistants are graduate students, and, as most of them come from other colleges, the majority of assistants in Botany 1 are men who have not had the course in Harvard and are consequently unfamiliar with the aims and methods of the instructor in the course above referred to.

It seems highly desirable to your Committee that provision be made for an instructor who shall remain for a number of years and give his entire time to the course during the second term, when Botany 1 is given. If the Corporation is unwilling to be at this expense, it would be well to begin with another assistant, to be paid five hundred dollars in addition to the sums already devoted to assistance. The duties of this assistant would be to supervise all the laboratory work, visiting all the sections in turn. He would not, therefore, take the place of any of the assistants now employed. The professor in charge should, of course, continue to visit the sections himself as often as possible.

It is obvious that the instructor loses much valuable time in repeating every year this work of training his assistants, and your Committee urgently calls your serious attention to this question.

Respectfully submitted for the Committee.

WALTER DEANE,
Chairman.

JUNE 8, 1915.

No. 71

REPORT OF THE COMMITTEE ON FORESTRY

To the Board of Overseers of Harvard College: —

The Committee appointed by the Board of Overseers to visit the School of Forestry respectfully submit their second report: —

On May 11th, 1910, the first report of this Committee was submitted to the Board of Overseers by our Chairman, the late Charles Francis Adams.

To fill the place of Mr. Benton MacKaye, former Instructor in Mensuration and Management, and to further increase and strengthen the quality of instruction given, Mr. E. E. Carter of the U. S. Forest Service was appointed Assistant Professor, and began his duties in the Autumn of 1910. To obtain the services of Mr. Carter it was necessary to offer him a salary of $2,500 per annum, which was $1,000 more than Mr. MacKaye had received, and at that time more than the Corporation were able to appropriate. Considering it of great importance to obtain the services of Mr. Carter, Messrs. W. R. Butler and J. S. Ames, members of the Visiting Committee, in a letter to the Corporation guaranteed for five years an annual payment of $2,000, one thousand dollars of which was to be paid Mr. Carter, and one thousand dollars for increasing and strengthening instruction in other ways. It was understood that at the end of this five-year period the College would assume the payment in full of Mr. Carter's salary. On May 18th, 1915, the last payment to the Treasurer of Harvard College was made, completing the Committee's guarantee in full. Subscriptions to this five-year guarantee fund were obtained by the efforts of the members of this Committee, from generous friends of the University. The following payments have been made to the Treasurer of the College by the Treasurer of the Committee: —

1911			
March	28.	Expense in Cambridge and Petersham	$1,000
March	28.	Account of salary of Asst. Professor Carter and appropriation	4,455
1912			
June	8.	Account of salary of Asst. Professor Carter and appropriation	1,780
		Check from Oakes Ames sent direct	200
		Amount carried forward,	$7,435

		Amount brought forward,	$7,435
1913			
June	13.	Account of salary of Asst. Professor Carter and appropriation	1,545
1914			
March	30.	Irving W. Bailey (Hardwood volume table) *	250
1915			
May	18.	Account of salary of Professor Carter and appropriation	2,020
June	11.	Salary of J. M. Gries, Instructor	1,300
		Total	$12,550

Included in the $1,000 under the heading of Expenses at Cambridge and Petersham, $250 was expended in providing the School with a modern system of accounting in connection with the work at Petersham by C. H. Scovell & Co., expert accountants. Besides the payments already made, the Committee has appropriated $250 to be expended in purchasing a micro-photographic apparatus to be used in connection with the work being done in wood-technology.

From the date of the foundation of the Forestry School in February, 1904, until the Summer of 1912, the general scheme of training remained unchanged, — that is, a prescribed general elementary course, modeled on German lines, whose chief aim was to fit men to enter the U. S. Forest Service. A small change was made in the Summer of 1912, when the School offered its own course in forest surveying and map making, in order to correlate this work more closely than had been possible when it was required for admission. In the year 1913–14, a more fundamental change was made in the organization of the School. All elementary and general forestry courses were given in the first year, so that in the second and final year, a student could devote himself exclusively to one of several lines of work specializing in the field of employment which he intended to follow. At the same time, the Cambridge quarters of the School were transferred to the Bussey Institution in Jamaica Plain, whose equipment and resources were indispensable for successfully inaugurating the new plan. Besides the collections of materials of the Department of Entomology, there was in the new situation ready access to the Arnold Arboretum and its library, making available for graduate students unexcelled opportunities for special advanced training in forest entomology, wood technology and dendrology.

* Payment made direct to Asst. Professor Bailey.

The adoption of this change in the curriculum and policy of the School seems to have been very wisely dictated by the following considerations.

That there is an overproduction of foresters in the United States, twenty-one colleges in the last fifteen years conferring degrees in forestry and twice that number giving partial courses.

That there is no longer ready access to the U. S. Forest Service, there being a long waiting list, and very few vacancies.

That Harvard, through the Bussey Institution, the Arnold Arboretum, and the Harvard Forest at Petersham, offers unrivalled opportunities for research and advanced study.

It was felt, however, that these changes did not go far enough, and that a course of study was further needed in connection with the Business School, to fit men for positions with the great lumber industries of the country. The new programme was designed to include courses on the lumber industry, in all its various phases of cost accounting, factory management, commercial contracts, marketing, etc. These new courses of study were strongly recommended to the Corporation by the staff of the Forestry School, in a memorandum dated February 6th, 1914, which is incorporated in the report of Assistant Professor Fisher, Director of the Forestry School, which is appended to this report. At a meeting of the Visiting Committee of March 30th, 1914, the following vote was unanimously adopted: "Voted, that this Committee heartily approve the idea of establishing a business course in lumbering, the School of Forestry coöperating with the School of Business Administration to that end; also that the sum of $1,300 be appropriated towards establishing this course for the year 1914–15."

Mr. John M. Gries of the U. S. Bureau of Corporations at Washington was secured to give the courses on the lumber industry in connection with the courses given in the Business School. The first year's results have been very satisfactory, as will be seen in the appended report of Assistant Professor Fisher, and the help afforded by the Visiting Committee during the first year, while the new courses were on trial, seems amply justified.

Outside of the courses in the Business School and on the lumber industry in which the enrolment for the year 1914–15 was sixteen students, the number of men enrolled in the School is less than in former years, only a total of six specializing in other lines of study. It is clearly understood, however, that the field of investigative and research work for which the School and its resources are now being developed will necessarily attract fewer numbers than a general elementary course.

The measure of the school's success and usefulness will depend not only on the value of the training given the students and their ability in their special lines of work, but even more fully on the trained investigators, the staff of the School, in using to the greatest advantage the resources that the College offers in the Bussey Institution, the Arnold Arboretum and the Harvard Forest at Petersham. The investigative possibilities of the Harvard Forest are very great, a great laboratory admirably suited for much useful and important original work in silviculture, planting, management and coöperative work on entomology with the staff of the Bussey Institution.

At the end of the report of the Director of the School is given a list of the studies completed or in progress by members of the School's staff. It is interesting to note that eight of the twelve studies are based entirely on data furnished by the Harvard Forest in Petersham.

Respectfully submitted,

JOHN S. AMES, *Chairman.*

June 23, 1915.

REPORT ON THE SCHOOL OF FORESTRY

With the year 1914–15 the School of Forestry has finally abandoned a prescribed general course, such as practically all schools have hitherto given, and undertaken instead exclusively specialized work in which the instruction of qualified graduate students, who desire training in a particular subject, is combined with research and investigation by members of the staff. This arrangement presupposes that students should already have had either a general course in forestry, or the scientific training in college which would qualify them to pursue their chosen specialty, or (in the case of special students) at least three years of professional experience. This means, in other words, men who intend to become specialists and experts. Along with this change in the nature and aim of the instruction, and made necessary by the abolition of the Graduate Schools of Applied Science, has come a change in organization whereby the instructors in forestry and those of the Bussey Institution have been combined by vote of the Corporation into a new and separate Faculty of Applied Biology. The desirability and wisdom of this reorganization of the school work was indicated very strongly both by the recent history of forest education throughout the country and by conditions within the University.

During the past fifteen years (which covers the life of the profession in the United States) twenty-one colleges have come to offer degrees in forestry and twice as many more give partial courses. Instruction everywhere was elementary and general, and modeled primarily according to the requirements of the government service, which for a number of years formed the main opening for employment. While the Forest Service was undergoing its rapid expansion practically all the output of foresters was absorbed. But since the government organization has ceased to develop so rapidly there has been a marked over-production of foresters. Meanwhile, since so much of the emphasis of professional training has been put on government work, the schools have failed to develop any strong demand for men on the part of the privately owned forest resources of the country, upon which forestry as a life profession must ultimately rest. This is a field which includes four times the acreage and twenty times the business of the government and states combined. That forestry has made relatively small progress with the great wood using industries of the country is fundamentally due to its failure to appreciate that the immediate problems of American lumbering are not concerned with production, with providing for future crops, but with more efficient manufacture and marketing of existing supplies and that the science of timber growing can be applied only when improved conditions, — protection, utilization, market and business organization, — make it profitable. Furthermore, except in the quality and amount of instruction there has been but little difference between the subjects taught in undergraduate and those in graduate schools, and in consequence with the increase of undergraduate schools there has been a marked falling off in attendance at the graduate institutions.

The following extract from a memorandum submitted to the Corporation on February 6, 1914, sums up the chief points of the plan for reorganization and the reasons in favor of it: —

> After a year's further study of the situation both here in the University and in the country at large, the staff of the School is unanimous in believing that the time has come to organize squarely and exclusively, as an institution for research and the training of advanced specialists. Their reasons for this belief are, first, that on the old basis we were competing in a field in which too many other schools offered nominally equivalent training; second, that while the market for men of general training is shrinking, the market for men of special training, particularly in problems relating to the lumber business, is growing; third, that a general course precludes research and special training by the same corps of instructors; fourth, that with the resources now for the first time available, through alliance with the Bussey Institution and its staff, through proximity to the Arnold

Arboretum, and through the possibility of the coöperation with other scientists in the University, the School has an equipment for certain lines of research and specialization that is unrivalled in this country. The School of Forestry therefore proposes to give up entirely its general course, to devote itself strongly to the research which the elementary teaching has hitherto precluded, and to offer to qualified men, opportunity for advanced training in the following fields: (1) The management and silvicultural treatment of forests, for which work the Harvard Forest is the chief laboratory; (2) the control of insect pests, for which Professors Wheeler and Brues will furnish the means; (3) dendrology, through Professor Jack and the Arboretum; (4) wood technology and researches in wood utilization, through Professor Bailey and his laboratory; and (5) the scientific study of lumbering and logging and the economics in those processes which only technical investigation can bring about. For the first four of these specialties, the School is already strongly equipped. For the last, the lumbering, it is practically unprovided. At the present moment, it is this special work in lumbering that will be most in demand, because so many of the problems of timberland management must be solved from that approach. Furthermore, it is this work that the School has all along foreseen the importance of, and which it is known to have been aiming toward. If we proceed now upon the new basis, working only in the specialties already provided for, we shall be moving in the right direction but we shall have failed to enter the field where specialization is most needed. If, on the other hand, we can add the lumbering to our other subjects, we shall not only be first in the field, but shall point our whole scheme with the study most vitally related to the whole industry for which forestry is working.

The scheme here outlined was thoroughly discussed with President Lowell and Mr. Bacon, and the Corporation voted to approve it with the reservation that at the time lack of funds would prevent the establishment of the special instruction in lumbering. As this subject seemed to the staff of the School of great importance, the possibility of providing it in coöperation with the Business School was discussed with Dean Gay, who offered his support and approval at once. The arrangement agreed upon was that a joint course should be offered to be grouped around specific instruction in the lumber business by a special instructor, the Staff of the Forestry School to contribute an introductory course in the outlines of Forestry, and the Business School, the necessary collateral courses in Accounting, Manufacturing, Marketing, etc. As instructor in Lumbering, Mr. John M. Gries was secured from the Bureau of Corporations at Washington. The Visiting Committee for Forestry, on behalf of the School of Forestry, guaranteed $1,300 towards his first year's salary, and Dean Gay, for the Business School, undertook to be responsible for his salary thereafter.

At the opening of the college year in September, ten students registered for the new lumbering course and this number was

augmented at the opening of the second half-year to sixteen. These men represented widely scattered parts of the country and were of exceptional ability and training. Several were from Forestry Schools, but the majority were men directly interested by family connection or commercial experience in the lumber business. Two were sent by their employers to take the course. The registrations in the other fields of specialization are as follows: In silviculture and forest management, three, one of whom is also registered in forest entomology; in wood structure and plant anatomy, two; in forest entomology, two. In these fields of work the emphasis hereafter will be primarily on research, in problems bearing on the management, protection, and utilization of forests and forest products. It will be incidental to this work and by its means that advanced students will get their specialized training in a chosen field. The men who are qualified by preparation to pursue such work are few, and a place for experts in professional employments is necessarily small. Both for success in research as well as in instruction a small number of high grade students is to be desired. The significant thing about the new plan is that for the first time it makes possible the development of experiment and research, for which the resources of the School, especially the Harvard Forest, are particularly adapted, and could never have been brought about while a large number of elementary routine courses were being given. With this respect the School profits greatly by combination with the Staff of the Bussey Institution, with whom the aim is research and the training of specialists, and several of whom are working in fields closely allied to forestry. As bearing on the desirability of the new scheme it is significant that already a number of schools have followed the Harvard example, both by providing graduate specialization, and, in the case of the University of California, by proposing to establish a course in the lumber business.

At the time of the acquisition of the Harvard Forest in 1908, it was stipulated by the Corporation that the maintenance of the property should not be a burden upon the general funds of the University. Owing to the unusually favorable situation and condition of the Forest, both as to supply of timber and accessibility to market, this stipulation could be fulfilled. Furthermore, it was desirable both as a means of instruction and for the benefit of other forest-owners to conduct a demonstration of forestry on a practical and commercial scale. Therefore, up to the recent change of plan, the policy of management was first to derive what income

from wood and timber the forest could continuously produce, and second to use both the land and the practical operations for elementary instruction in silviculture, forest measurements, surveying, etc. At the outset, the amount of annual growth, disregarding cordwood, was estimated to be 250,000 feet. Up to the year 1914–15 there have been cut approximately 1,200,000 feet of lumber and 1,000 cords of wood, yielding a net annual return over the cost of marketing of $1,500 to $2,000, most of which has been spent upon the maintenance of the School plant. Since from seven months to a year are required to market one cut of lumber, it was necessary to have operating capital for the first year. This the University advanced to the amount of $3,000 at 4½ per cent. In another year, this loan should be entirely paid off, and the Forest will then be running on its own funds.

The operations so far conducted on the Forest have considerably increased the area of woodland and the rate of production, notwithstanding the fact that the chestnut disease has almost eliminated the growth at present accruing from this species. About thirty acres of waste and vacant land have been restocked by plantations. Of about thirty acres from which mature timber has been cut, more than half is satisfactorily restocked by natural reproduction, and the remainder will be reproduced in part by natural seeding and in part by planting. Incidental to the main cutting of mature timber and the reforesting of vacant land, thinnings and improvement cuttings have been carried out in young and mixed growth as fast as market and resources would permit, and have resulted in converting a substantial area, between forty and fifty acres, into producing condition. The net result of these three kinds of operation has been to increase both the amount and the quality of the total yield from the Forest.

From the standpoint of scientific result as well as practical use to the forest owner, the operations above outlined have a value that increases each year. In every case, forest conditions at the outset, method and purpose of the treatment, costs, yield and returns, together with results as observed by subsequent observation, are all available in systematic records. Already a number of useful conclusions relating to such matters as the relation of planting methods and planting stock to conditions of soil, exposure, and vegetation, the reproduction of pine and hardwoods by various cutting methods, and the possibilities of increasing growth and future value by early thinnings have been reached. Supplemented by a file of photographs and by the machinery of a good cost-

accounting system, such records form the material upon which a large number of special researches can be based. Under the former plan, with the large amount of elementary and routine teaching, and of administrative work which were necessary, the conduct of these special investigations and even the upkeep of the routine records were greatly hampered. Yet even before the change of plan, it was increasingly apparent that not to develop the Forest as an experiment station was to miss its greatest possibility.

From now on, in addition to the strictly commercial operations, special investigations into problems bearing on the handling of woodlands will be added to the ordinary activities of record and management. A number of these are already under way, dealing with methods of reforestation, the adaptability of exotic species, the board-foot yield of logs as related to lumber thickness, and the results in yield and money of weeding young mixed growth. The following is a list of studies completed or in progress by members of the staff: —

Published:

Carter, E. E. A Volume Table for Red Maple. *Bulletin of the Harvard Forestry Club.*

Carter, E. E. The Use of Yield Tables in Predicting Growth. *Proceedings of the Society of American Foresters.*

Carter, E. E. Results of Planting Experiments on the Harvard Forest. (Two papers.) *Forestry Quarterly.*

Bailey, I. W. Graded Volume Tables for Beech, Birch, and Maple. *Forestry Quarterly.*

Bailey, I. W. The Effects of Climate on Vegetation in Different Parts of the World. *Annals of Botany.*

Bailey, I. W., and Shepherd, H. B. Studies of Fiber Length in Certain Conifers. *Forestry Quarterly.*

Bailey, I. W. Relation of Wood-structure to Penetration of Preservatives. *Paper for American Railway Engineering and Maintenance of Way Association.*

Bailey, I. W. Differential Stains for Wood-destroying Fungi. *Paper for Annual Meeting of Phytopathologists.*

Jack, J. G. A Check-list of Trees and Other Woody Plants Found on the Harvard Forest. *Bulletin of the Harvard Forestry Club.*

Fisher, R. T. An Account of Operations on the Harvard Forest. *Bulletin of the Harvard Forestry Club.*

In preparation:

Carter, E. E., in collaboration with Brues, C. W. Relation of Insects of the Genus Hylobius to the Reforestation of Cutover Softwood Lands.

Fisher, R. T. The Financial Possibilities of Silvicultural Methods, of Weeding Mixed Young Growth.

Carter, E. E. Comparative Board-foot Yield in Sawing as Related to Thickness of Lumber.

As regards the future, the Corporation has definitely voted that the Forest is to be developed as an experiment station, both for its own sake and that of the intending specialists whom such development would profit. In the coöperation with the Business School and the collaboration with other men in the Business Faculty, there is prospect of valuable result, both in scientific material and opportunity for instruction. In some respects the general expenses hitherto incurred by the Forestry School will shrink, but all available funds, both income from the Forest and gifts that may be received, will be needed for the proper conduct of investigative work.

RICHARD T. FISHER, *Director.*

June, 1915.

For the use only of the President and Fellows and Overseers.

EXECUTIVE COMMITTEE.

REPORT OF THE SECRETARY FOR THE ACADEMIC YEAR 1913–14.

GEORGE WIGGLESWORTH, Esq., *Chairman.*

DEAR SIR:

Pursuant to Section 30 of the Rules and By-Laws of the Board of Overseers, I have the honor to submit the following report concerning the Reports of Visiting Committees of the Board of Overseers for the academic year 1913–14.

Eleven reports were presented during this academic year, as follows: —

1. Jan. 9, 1914, Astronomical Observatory.
2. Feb. 27, 1914, Medical School.
3. " " " Chemical Laboratory.
4. Apr. 13, 1914, Graduate School of Arts and Sciences.
5. " " " Economics.
6. " " " Geology, Mineralogy, and Petrography.
7. Apr. 21, 1914, University Library.
8. May 18, 1914, Botanic Garden.
9. " " " Botany.
10. " " " Botanical Museum.
11. June 18, 1914, School of Engineering.

1. ASTRONOMICAL OBSERVATORY. — The Committee limits itself to the important subject of the variability of stars, in which the Observatory occupies a most prominent position in the astronomical world, and calls particular attention to a valuable series of publications, issued by the Observatory, in relation to this important subject. The Observatory, through this important work, has become the central publishing bureau for variable star observations. In the language of the Committee,

" The whole subject is not only interesting academically as a branch of abstract knowledge of the Physical Universe but it is being brought home to us as of great practical importance. All our earthly interests are dependent upon the Sun, and our Sun has been shown to be a variable star. Thus the interest of humanity in this subject is far reaching.

" The investigation is still in its infancy and who can tell that the knowledge we draw from afar may not have supreme importance in the counting house and the market, and perhaps in regard to the ultimate destiny of humanity."

2. Medical School. — Since the report of the Committee in 1912–13, the Brigham Hospital has been opened, and is now in full working order, and the Children's Hospital and the Infants' Hospital are both completed, and will soon be opened for the admission of patients. The great Medical Undertaking, begun in 1906, is now, therefore, in a fair way to full achievement. Many improvements in the curriculum of the School have been made during the year, and the researches carried on in both the Laboratory and Hospital Departments are noticeable for excellence as well as volume, and give eminence to the School today as both a teaching and a research institution. The year 1912–13 also showed a substantial surplus for the School and a careful administration of its finances. The Committee calls attention especially to two important needs of the School, the establishment of some form of a periodical publication in the name of the School, and the appointment of a business manager for the purchase of supplies and the management of many activities which are now administered by Committees of the Faculty.

3. Chemical Laboratory. — The Committee notes a distinct increase in the number of students in the courses in Chemistry at the average rate of over fifteen per cent during the past four years, and that there are relatively large numbers of students concentrating in Chemistry. The most urgent needs are a general laboratory for the use of the students and a laboratory for Industrial Chemistry. A special report upon the financial affairs of the Laboratory by a Sub-Committee shows the constant need of funds for the development of this Department of the University. They estimate that at least five hundred thousand dollars would be necessary to build and endow a suitable Elementary Chemistry building. They are of opinion that the cost to students in various Chemical courses is too high, and recommend that this cost should be reduced by charging a part thereof to the general expense account of the College.

4. Graduate School of Arts and Sciences. — This is the first report presented by the Committee during a period of six years. The Committee is impressed with the importance of the School, since a large number of its students become teachers throughout the country, and thereby extend the influence of Harvard methods, and it believes that the Departments are efficiently conducted, and much earnest work is accomplished, but is impressed with the fact that the numbers in some of the Departments, notably that of the Classics and of Physics, are very much smaller than they ought to be. On the whole, the condition of the School is found to be satisfactory.

5. Economics. — The enrolment of students in Economics for the first half of the academic year shows a falling off from 1634 to 1520 students, the most significant loss taking place in the course on Banking. The amount of instruction offered at Harvard in Economics exceeds that offered at any other University except Michigan, while in the amount of money expended Harvard is far in the lead. The Committee notes the continuing eminence and prosperity of the *Quarterly Journal of Economics*, published by the Department since 1886, which maintains its place as one of the foremost periodicals in the subject in the English Language, and perhaps the foremost. It has the largest circulation of any periodical published by the University, except the *Law Review*, and there is no more certain way of making a reputation as a writer on Economic subjects than to publish an article in this journal. The most important need of the Department is a fund for the endowment of Economic Research, which will make possible the scientific investigation of pressing economic questions. A very interesting supplemental report is made by Mr. John Wells Morss, one of the members of the Committee, representing the views and experience of a man of business, rather than of a student of education. It should be read as a whole, as it is difficult to give a satisfactory impression of its interest and value by quotations or a summary.

6. Geology, Mineralogy, and Petrography. — The past year was one of decided progress in the development of the Department, the attendance and instruction both approaching in amount that prior to the decline of the Department after the death of Professor Shaler. The Committee calls particular attention to the great and valuable gift of the mineralogical cabinet of Mr. A. F. Holden, of the Class of 1888, a collection worth at least from sixty to eighty thousand dollars, and placing the mineral collection of Harvard next in rank to those of the British Museum and the New York Natural History Museum. The Department is to receive later a large sum from the Holden estate. An effort is being made to bring about closer relations between the Blue Hill Observatory and the government work in Washington. An important question for future consideration is to what extent can we reduce expenses, by reason of the Technology affiliation, and yet further a comparative study of geological instruction in Harvard and elsewhere.

7. University Library. — The report dwells altogether upon the great gift of the Harry Elkins Widener Memorial Library to the University, now rapidly approaching completion, and makes no recommendations at the present time, deeming it to be one

chiefly for congratulation and for a deep sense of obligation to the munificent donor of the Library.

8. Botanic Garden. — No important changes have taken place during the year, while the number of plant species cultivated in the open ground has been largely increased. The most pressing need of the Garden is an increase in its invested funds which will yield between two and three thousand dollars per year.

9. Botany. — The various courses in this Department are running about as usual, and there appears to be nothing worthy of note in connection therewith. The laboratory facilities of the different courses in Botany, given at the Museum, are, however, most inadequate, and the Committee recommends strongly that better accommodations for them be provided at the earliest possible opportunity.

10. Botanical Museum. — The glass models last received from the Artist-Naturalist Blaschka illustrate the greater number of types of insect-assistance in the impregnation of flowers. The series is now very near its completion, and the whole collection comprises more than 700 full-size flowering branches with blossoms, and over 3800 details and magnified sections. The collection is without rival in the world, and is entirely due to the munificence of a member of this Committee, and her Mother, in memory of a graduate of the College. The Committee regret that no systematic instruction in Economic Botany has been provided since Professor Goodale's resignation, and are of opinion that steps should be taken to remedy promptly this loss.

11. Engineering School. — This is the first report presented during the last six years. The Committee feels that after coöperation with the Massachusetts Institute of Technology is effected the elementary courses in Engineering, now given in Harvard College, should still be retained in the College as a part of the liberal education which goes with the College degrees. The Committee also recommends that beginning with the school year 1914–15, the present Division of Engineering Sciences be made a Department, and associated with the Department of Physics and of Astronomy, in a " Division of Physical Sciences."

WINTHROP H. WADE.
Secretary of Executive Committee.

September 28, 1914.

REPORT OF THE EXECUTIVE COMMITTEE OF THE BOARD OF OVERSEERS ON THE INCREASE IN THE TUITION FEE

To the Board of Overseers of Harvard College: —

Your Executive Committee to whom was referred the question of the proposed increase in tuition fees beg leave to report as follows:

They have carefully considered the matter and secured the opinions of various alumni and students, and have had a conference with a sub-committee of the Faculty, and have come to the conclusion that an increase in the tuition charge to $200 should be made, but that this should cover laboratory fees, except charges for breakage, and should also include the fee for graduation in the Graduate School of Arts and Sciences and the charge for the Stillman Infirmary, amounting in all to about $15 per student, so that the net increase to the student will be about $35 per year. This increase should not apply to the Medical School, where the charge is already approximately $200, nor to the Divinity School, where agreements with other institutions make a change out of the question, nor should it apply to the Law School, where the Faculty have voted against making any increase, but should apply to the other departments of the University.

Your Committee feel that this increase is made necessary by the increased cost of most things at the present time, and by the greater facilities which Harvard is offering its students. They feel also that in the case of the well-to-do students the addition will not be a serious matter, and that in the case of other students who might be seriously hampered the difficulty can be relieved by an increase in the amounts of scholarships and fellowships; * and by making some provision permitting the remission in exceptional cases, within the discretion of the Corporation, of the whole or a part of the extra charge.

* There are 115 scholarships and fellowships in the Graduate School and 299 in the College which are affected. The number of students entering per year is about 1000.

The question on which there is apparently the greatest difference of opinion between the Corporation and the Faculty is as to the time when this increase should go into effect. The Faculty desire that it should be put in force for the year 1916–17 for all members of the University with the exception of the Medical, Divinity, and Law Schools. Their argument is: that there is no contract between University and Student that the fee will not be raised during the four years of the student's stay in the College, just as there is no contract that the student will remain there four years; that to make a difference in the charge to different students will lead to confusion and dissatisfaction; that on a previous occasion Harvard increased the amount of tuition without any notice (this was in 1869, when the fee was raised from $104 to $150); that at Princeton an increase in tuition was made without notice, and that the recent advance at Yale was made to apply to all entering six months later (this took effect in 1914); that by making the tuition payable in quarterly payments in advance the burden will be less felt (under the present system $94 has to be paid at the outset, which in the case of poor students is believed to be a difficult matter); that many students who have very small means have been asked as to whether such an increase in the tuition fee would prevent their continuing their college work or would be deemed by them unjust, and that the reply in the case of all but a very small percentage of those asked, 8 per cent or less, has been that it would not prevent their continuing at Harvard, and that in no case has it been claimed that the advance would be unreasonable; that there has been a deficit for a number of years in the amount of income as compared with the amount of expenditure, and that next year there will be a large increase in expenses owing to unusually heavy additions to the salary list, about $21,000, and owing to the cost of maintaining the new library, probably about $32,000; that it is therefore important that relief should be secured promptly.

On the other hand, your Committee feel that, while there may not be any binding legal contract, there is a certain moral obligation on the part of the University to let its present students finish their work on the same basis of charge as that prevailing when they entered the University, and that this should apply not only to present students but also to those entering College this year; that while there has been a deficit when one compares expenditure with income, nevertheless the property of the University has increased very largely. From 1880 to 1914 the invested

funds of the entire University have increased more than twenty-three and a half million dollars. Within ten years these invested funds have increased over eleven million dollars. There may be added also land and buildings costing about two and a third million dollars, which figures do not include anything at the Medical, Divinity, or Law Schools. The University, College and Library Account, so called, includes simply the Undergraduate Department and the Graduate School, but leaves out all funds for Museums, the Bussey Institution, and all Graduate Schools except the Graduate School of Arts and Sciences. In 1880 this account amounted to less than two million dollars. Ten years ago it had increased to over eight and a half million dollars, and in 1914 it had grown to nearly fifteen million dollars. In other words, since 1880 there has been a gain in this account of about thirteen million dollars. During the last ten years the increase has been nearly six and a third million dollars. It cannot, therefore, be said that it is impossible for the University to encroach a little further on its unrestricted funds, amounting in 1914 to more than nine and a quarter million dollars, rather than to run the risk of creating throughout the country a feeling that it has treated its students with a lack of due consideration. It is true that many of the large gifts are limited to special purposes, and that the deficit which this year is $52,000 will next year probably be materially larger, perhaps something like $105,000, unless more income is obtained, but in so postponing the time at which the increase shall take effect we should be doing what the Massachusetts Institute of Technology did some years since when it was obliged to increase its charge for tuition, and your Committee feel that this is the fairer and better method. They do not feel that the difference in the rate of charge to different students is a serious matter, since in many businesses corresponding differences in charges exist.

To recapitulate briefly, therefore, your Committee recommend that, beginning with the academic year 1916–17, the tuition fee for new students be $200 in the following departments: Harvard College, the Graduate School of Arts and Sciences, the Graduate School of Business Administration, the Schools of Architecture and Landscape Architecture, and the Bussey Institution with the School of Forestry, but that students registered before that time in any of the above departments be charged a tuition fee of $150 so long as they continue in the departments in which they are then registered, and that no fee for Stillman Infirmary, or for laboratory, except for breakage, or for graduation in the Graduate School of

Arts and Sciences, be charged to any student paying a tuition fee of $200 or more. Further, that all resident scholarships and fellowships in the departments under the Faculty of Arts and Sciences be increased until further notice by an amount equivalent to the proposed increase in tuition. That the present charges for examinations to make up conditions and the present charges for additional courses be continued, but that for students taking less than full work payments by the course be pro rata; that is, $50 per course, $25 per half-course, and, finally, that the tuition fee be payable in advance in four instalments.

Respectfully submitted,

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L. A. FROTHINGHAM,
G. v. L. MEYER,
GEORGE WIGGLESWORTH,
Committee.

April 12, 1915.

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